

WHAT IS CLAIMED IS:

1                   1.       A carrier for a semiconductor die package, the carrier comprising:  
2                   (a)       a metal layer; and  
3                   (b)       a plurality of bumps formed in the metal layer,  
4                   wherein the carrier is for electrically coupling a semiconductor die to a circuit  
5 substrate.

1                   2.       The carrier of claim 1 wherein the metal layer comprises copper.

1                   3.       The carrier of claim 1 wherein the plurality of bumps are disposed in  
2 an array and are stamped bumps.

1                   4.       The carrier of claim 1 further comprising:  
2 a die attach region, and wherein the plurality of bumps are arranged around the  
3 die attach region.

1                   5.       The carrier of claim 1 further comprising a dielectric layer, wherein the  
2 metal layer is on a dielectric layer.

1                   6.       The carrier of claim 1 wherein the metal layer includes one or more  
2 sublayers of material on a base metal.

1                   7.       The carrier of claim 1 wherein the metal layer is discontinuous and  
2 includes a plurality of etched conductive lines that lead to the plurality of bumps.

3                   8.       The carrier of claim 1 wherein each bump has a conical angle of about  
4 40 degrees of more.

1                   9.       The carrier of claim 1 wherein each bump has a conical shape.

1                   10.      A semiconductor die package comprising:  
2                   (a)       a carrier comprising a metal layer, a die attach region, and a plurality  
3 of bumps formed in the metal layer; and  
4                   (b)       a semiconductor die electrically coupled to the die attach region of the  
5 carrier.

1 11. The die package of claim 10 wherein the plurality of bumps are  
2 stamped bumps and are arranged around the die attach region, and wherein each of the bumps  
3 has a height that is greater than or equal to a thickness of the semiconductor die.

1 12. The die package of claim 10 wherein the carrier comprises copper.

1 13. The die package of claim 10 wherein the carrier comprises:  
2 a base metal with one or more coatings on the base metal.

1 14. The die package of claim 10 wherein each bump has a conical angle  
2 greater than about 40 degrees.

1 15. The die package of claim 10 wherein the semiconductor die comprises  
2 a vertical metal oxide semiconductor field effect transistor (MOSFET) device.

1 16. The die package of claim 10 wherein the semiconductor die comprises  
2 a vertical metal oxide semiconductor field effect transistor (MOSFET) device having a source  
3 region, a gate region, and a drain region, wherein the drain region is proximate to the die  
4 attach region of the carrier, and the source region and the gate region are distal to the die  
5 attach region of the carrier.

1 17. The die package of claim 10 wherein each stamped bump has a conical  
2 shape.

1 18. The die package of claim 10 wherein the bumps and the semiconductor  
2 die are at opposite sides of the carrier.

1 19. The die package of claim 10 wherein the bumps and the semiconductor  
2 die are at the same side of the carrier.

1                   20.     A semiconductor die package comprising:

2                   (a) a carrier comprising metal layer, a die attach region, and a plurality of  
3 stamped bumps formed in the metal layer around the die attach region;

4                   (b) a semiconductor die comprising a vertical metal oxide semiconductor field  
5 effect transistor (MOSFET) device having a source region, a gate region, and a drain region,  
6 wherein the drain region is electrically coupled to and proximate to the die attach region of  
7 the carrier, and the source region and the gate region are distal to the die attach region, and  
8 wherein the plurality of stamped bumps in the carrier are arranged around the semiconductor  
9 die; and

10                  (c) a plurality of solder deposits disposed on the semiconductor die.

1                   21.     The semiconductor die package of claim 20 wherein the each of the  
2 bumps has a conical angle greater than about 40 degrees or more.

3                   22.     The semiconductor die package of claim 20 wherein the carrier  
4 comprises copper.

5                   23.     The semiconductor die package of claim 20 the plurality of bumps are  
6 formed simultaneously in the metal layer.

7                   24.     A method for forming a carrier for a semiconductor die package, the  
8 method comprising:

9                   (a) providing a metal layer; and

10                  (b) forming a plurality of bumps in the metal layer, wherein the formed  
bumps are capable of being electrically coupled to conductive regions of a circuit substrate.

1                   25.     The method of claim 24 wherein forming the plurality of bumps  
2 comprises stamping.

3                   26.     A method for forming a semiconductor die package, the method  
4 comprising:

5                   (a) forming a carrier according to the method of claim 24; and

6                   (b) attaching a semiconductor die to the metal layer after forming the  
7 plurality of bumps.

